

REMARKS

Claims 1, 14, and 24 have been amended to clarify the language contained therein without narrowing the scope thereof. No new matter has been added. Upon entry of this Amendment, claims 1, 4-6, 8, 12-17, 19-21, and 23-27 remain pending. Reconsideration and allowance of the pending claims are respectfully requested.

In the Office Action dated January 25, 2008, claims 15, 20, and 21 were rejected under 35 U.S.C. §102(e) as being anticipated by Bristol et al. (U.S. Published Application No. 2005/0074706). Applicant respectfully traverses this rejection.

Claim 15 recites a method of fabricating a device using a lithographic process. As recited by claim 15, the method includes “applying a radiation sensitive resist on top of the device, the resist material incorporating a conductive material; and exposing a part of the resist to ultraviolet radiation while applying an electric field across the resist.” Applicant respectfully submits that Bristol et al. does not disclose, teach, or suggest all of the features of claim 15.

Bristol et al. discloses a substrate (12) that may be covered by a photoresist layer (10), and a thin layer of conductive material (14) may be applied over the resist (10). *See* Bristol et al. at [0024]-[0025] and FIG. 5. Bristol et al. does not disclose, teach or suggest a resist material that incorporates a conductive material, as recited by claim 15. The conductive material of Bristol et al. is taught to be on top of the resist and not incorporated with the resist.

Claim 20 depends from claim 15 and further recites “further comprising applying an electric field across the resist by directly coupling the resist to a fixed potential.” Applicant respectfully submits that claim 20 is patentable not only for its dependency from claim 15, but also for the additional features recited therein.

Bristol et al. does not disclose, teach, or suggest applying an electric field across the resist by directing coupling the resist to a fixed potential, as recited by claim 20. Instead, Bristol et al. teaches that the substrate (12) and/or conductive material (14) is directly coupled to a fixed potential. *See* FIGs. 1, 4-7. In some embodiments, an electrode (16a, 16b) is used to create the electric field, but the resist is not directly coupled to a fixed potential. *See* FIGs. 4 and 6.

In view of the foregoing, Applicant respectfully submits that claim 15 and the claims that depend from claim 15 are patentable over Bristol et al., and respectfully requests that the rejection of claims 15, 20, and 21 be withdrawn.

In the Office Action, claims 1, 4, 5, 12-14, 17, 19, and 24-26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cheng et al. (U.S. Published Application No. 2003/0008246) in view of Lei (U.S. Published Application No. 2004/0134420). Applicant respectfully traverses this rejection.

Claim 1 recites a method of fabricating a device using a lithographic process. As recited by claim 1, the method includes, *inter alia*, “exposing a part of the resist layer to ultraviolet radiation; and applying an electric field across the resist layer by applying a potential difference between the two conducting layers during the exposing, the direction of the field being substantially perpendicular to a plane of the resist layer.” The combination of Cheng et al. and Lei does not disclose, teach, or suggest all of the features of claim 1.

Contrary to the assertion in the Office Action at page 4, lines 1-5, Cheng et al. discloses a method in which an electric field is applied to the resist film during post exposure bake (PEB) and not during exposure to ultraviolet radiation. *See* Cheng et al. at Abstract and [0038]. Although Cheng et al. discloses the exposure process at [0077]-[0079], Cheng et al. does not disclose, teach, or remotely suggest applying an electric field across the resist layer during exposing, as recited by claim 1.

Lei does not make up for the deficiencies of Cheng et al. Lei discloses method that is suitable for the bubble-free application of a resin to a substrate. *See* Lei at Abstract. Lei does not even disclose applying an electric field across a resist layer at any time.

In view of the foregoing, Applicant respectfully submits that claim 1 and the claims that depend from claim 1, and include additional advantageous features, are patentable over Cheng et al. in view of Lei, and respectfully requests that the rejection of claims 1, 4, 5, 12, and 13 be withdrawn.

Claim 14 recites a lithographic apparatus that includes, *inter alia*, “an electric field generator configured and arranged to apply a potential difference between a layer of conductive material on an upper surface of the resist layer and a layer of conductive material on a lower surface of the resist layer, between the resist layer and the substrate, while the patterned beam is being projected, the direction of said field being substantially perpendicular to the plane of the resist layer.” The combination of Cheng et al. and Lei does not disclose, teach, or suggest all of the features of claim 14.

Cheng et al. and Lei are discussed above. For at least the reason that neither Cheng et al. nor Lei discloses, teaches, or suggests an electric field generator that is configured and arranged to apply a potential difference between a layer of conductive material on an upper

surface of the resist layer and a layer of conductive material on a lower surface of the resist layer – while the patterned beam is being projected – claim 14 and the claims that depend from claim 14 are patentable over Cheng et al. in view of Lei.

Accordingly, Applicant respectfully requests that the rejection of claims 14, 17, and 19 be withdrawn.

Claim 24 recites a method of fabricating a device using a lithographic process. As recited by claim 24, the method includes, *inter alia*, “exposing a part of the resist layer to ultraviolet radiation; and applying an electric field across the resist layer during the exposing, the direction of the field being substantially perpendicular to a plane of the resist layer.” The combination of Cheng et al. and Lei does not disclose, teach, or suggest all of the features of claim 24.

As discussed above, neither Cheng et al. nor Lei discloses, teaches, or suggests applying an electric field across a resist layer while a part of the resist is being exposed to ultraviolet radiation. As such, the combination of Cheng et al. and Lei does not disclose, teach, or suggest all of the features of claim 24.

In view of the foregoing, Applicant respectfully submits that claim 24 and the claims that depend from claim 24, and include additional advantageous features, are patentable over Cheng et al. in view of Lei, and respectfully requests that the rejection of claims 24-26 be withdrawn.

In the Office Action, claims 16 and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bristol in view of Singh et al. (U.S. Patent No. 6,319,643). Applicant respectfully traverses this rejection.

Claim 16 recites a method of processing a device using a lithographic process. As recited by claim 16, the method includes exposing the conductive resist material to UV radiation while applying an electric field across the resist material by directly coupling the conductive resist material to a fixed potential. Applicant respectfully submits that a *prima facie* case of obviousness has not been made in the Office Action, because one of ordinary skill in the art would not be motivated to combine Singh et al. with Bristol in the manner proposed in the Office Action, and there would be no expectation that such a combination would even be successful.

Specifically, one of ordinary skill in the art would not be motivated to substitute the thin conducting layer and resist of Bristol with the conductive resist of Singh et al. because the conducting layer of Bristol and the conductive resist of Singh et al. are used for

completely different purposes. Bristol teaches that the thin conducting layer (14) may be used to apply a potential to a chemically amplified extreme ultraviolet resist so that photoacid generators may be more evenly distributed in the resist. *See* Bristol at [0022]-[0025]. Bristol also teaches that the thin conductive layer may be washed away during the development stages of the resist. *See* Bristol at [0026]. In contrast, Singh et al. teaches that a conductive resist is used to reduce undesirable charge accumulation on a patterned photoresist – especially patterned photoresists used as standards for calibrating a measurement/evaluation instrument using an electron beam. *See* Singh et al. at col. 4, lns. 18-23. In other words, Singh et al. uses a conductive resist so that the end product has a (permanent) patterned conductive photoresist that may be used as a standard for calibration. *See* Singh et al. at Abstract. In contrast, the conductive layer of Bristol is not needed after the resist has been developed.

Because the conductive layer of Bristol and the conductive resist of Singh et al. are used for completely different purposes, Applicant respectfully submits that one of ordinary skill in the art would not replace the thin conductive layer of Bristol with conductive resist of Singh et al. As stated in the recent United States Supreme Court decision in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. ___, 82 USPQ2d 1385 (2007), “Often, it will be necessary for a court to look to interrelated teachings of multiple patents...in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be explicit.” *Id.* at slip opinion 14, 82 USPQ2d at 1396, citing *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). The Office Action only provides a conclusory statement to justify the combination. *See* Office Action at page 5, lines 8-10. No indication is given by the Office Action as to what method would be simplified and how such a method would be simplified.

Moreover, Applicant respectfully submits that the Office Action does not provide any indication that replacing the thin conductive layer of Bristol with the conductive resist of Singh et al. would allow the apparatus of Bristol to be used for its intended purpose. *See* MPEP §2143.02 (“at least some degree of predictability is required”). Applicant respectfully submits that any reasonable expectation of success was gleaned from Applicant’s disclosure and not the prior art, which is impermissible. *See* MPEP §2142 (“impermissible hindsight

must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art”).

In view of the foregoing, Applicant respectfully submits that claim 16 and the claims that depend from claim 16, and include additional advantageous features, are patentable over Bristol in view of Singh et al., and respectfully request that the rejection of claims 16 and 23 be withdrawn.

In the Office Action, claims 6, 8, and 27 were objected to as being dependent upon a rejected base claim. Applicant acknowledges with appreciation the indication that claims 6, 8, and 27 would be allowable if rewritten in independent form. However, in view of the foregoing, Applicant respectfully submits that all of the pending claims are allowable.

All rejections and objections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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